

DNR Project Number 180

Title: Development of a Groundwater Flow Model for the Mukwonago River Watershed, Southeastern Wisconsin

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Abstract: Wetlands of the Mukwonago River watershed have been the target of conservation efforts for almost two decades. Recent suburban development has spawned a rapidly expanding commuter population and increasing demands for public water supplies, with several new high capacity wells proposed within the last year. There is a critical need to evaluate potential effects of increased pumping and reduced recharge in order to protect the springs and wetlands of this watershed. The proposed project addresses the WDNR's high priority "emerging issue"; of groundwater withdrawals and connections to surface waters. The overall objective of the proposed project is to improve understanding of hydrogeologic controls on groundwater discharge to springs and wetlands in the watershed in order to allow assessment of current and potential future impacts of groundwater withdrawals and suburban development. The primary product of the research will be a numerical model of groundwater flow. The model will be developed by a telescopic mesh refinement process and calibrated using records of water levels and synoptic stream flow measurements. The project will also provide opportunities to 1) test a conceptual model of spring localization near buried bedrock valleys, 2) assess the usefulness of a regional scale model as the basis for development of local scale models, and 3) evaluate the combined use of water levels and geochemical signatures to constrain spring water sources. Users of the findings will include concerned parties in the watershed including The Nature Conservancy and local planners.

Work Location: Madison and Mukwonago River watershed

Project Duration: July 1, 2003 to June 30, 2005

Year 1 Budget (2003-04): \$29,010

Year 2 Budget (2004-05): \$20,993